AMERICAN

CHEMICAL JOURNAL

IRA REMSEN
EDITOR

CHARLES A. ROUILLER
ASSISTANT EDITOR

CASE
LIBRARY
CLEVELAND

VOL. XLVII.—JANUARY–JUNE, 1912.

BALTIMORE: THE EDITOR

ESCHENBACH PRINTING COMPANY, PRINTERS
EASTON, PA.

CONTENTS OF VOL. XLVII

No. 1.

A Further Study of the Products Formed by the Action of Heat on Parasulphamidobenzoic Acid. By W. C. Stoddard – 1

Contributions from the Sheffield Laboratory of Yale University:

CXCVI.—*On Hydantoins: The Action of Bromine on Tyrosinehydantoin.* By Treat B. Johnson and Charles Hoffman – – – – – – – – – – – 20

The Absorption Spectra of Comparatively Rare Salts. The Spectrophotography of Certain Chemical Reactions, and the Effect of High Temperature on the Absorption Spectra of Nonaqueous Solutions. By Harry C. Jones and W. W. Strong – – – – – – – – – – – 27

REVIEWS

Introduction à l'Étude de la Spectrochimie – – – – – 85
Chemie der Eiweisskörper – – – – – – – – 86
Grundriss der anorganischen Chemie – – – – – – 86
Kurze Anleitung zur Massanalyse – – – – – – 86
A Systematic Handbook of Volumetric Analysis – – – – 87
Laboratoriumsbuch für die Kaliindustrie – – – – – 87
Les Nouveautés Chimiques pour 1910 – – – – – – 88
The Polytechnic Engineer – – – – – – – – 88

No. 2

Contributions from the Chemical Laboratory of Cornell University:

The Two Phthaloximes and Some of Their Derivatives. By W. R. Orndorff and D. S. Pratt – – – – 89

The Absorption Spectra of Comparatively Rare Salts. The Spectrophotography of Certain Chemical Reactions, and the Effect of High Temperatures on the Absorption Spectra of Nonaqueous Solutions. By Harry C. Jones and W. W. Strong – – – – – – – – – 126

REVIEWS

The Technology of Bread-Making – – – – – – 180
Elektrochemische Umformer (Galvanische Elemente) – – – 181
Die Indirekten Methoden der Analytischen Chemie – – – 182
Anleitung für das Praktikum in der Massanalyse – – – – 183
Laboratoriumsbuch für die Industrie der Oele und Fette – – 183
Subject List of Works on Chemistry (Including Alchemy, Electrochemistry and Radioactivity) in the Library of the Patent Office 184

No. 3

FLUIDITY AND VAPOR PRESSURE. By Eugene C. Bingham – – 185
CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF HARVARD UNIVERSITY:
Certain Derivatives of Tetrachlororthobenzoquinone. By C. Loring Jackson and G. L. Kelley – – – – 197
ON THE DUALITY OF CHLOROPHYLL AND THE VARIABLE RATIO OF THE TWO CONSTITUENTS. By C. A. Jacobson and L. Marchlewski – 221
CONTRIBUTIONS FROM THE SHEFFIELD LABORATORY OF YALE UNIVERSITY:
CXCVII.—*Thioamides: The Action of Hydrogen Sulphide on Nitrogen-Substituted Aminoacetonitriles.* By Treat B. Johnson and Gerald Burnham – – – – 232
CONTRIBUTIONS FROM THE SHEFFIELD LABORATORY OF YALE UNIVERSITY:
CXCVIII.—*Hydantoins: The Action of Potassium Thiocyanate on Pyrrolidonecarboxylic Acid. 2-Thiohydantoin-4-Propionic Acid.* By Treat B. Johnson and Herbert H. Guest – – – – – – – 242

NOTES

The Density of Niton ("Radium Emanation") and the Disintegration Theory – – – – – – – – – – 251

OBITUARY

Heinrich von Brunck – – – – – – – – 265

REVIEWS

Jahrbuch der Chemie – – – – – – – – 266
Famous Chemists – – – – – – – – – 267
Die Mechanik der Wärme – – – – – – – – 267
Ueber eine neue chemische Theorie – – – – – – 267
Abhandlungen über Dialyse (Kolloide) – – – – – 268
Refraktometrisches Hilfsbuch – – – – – – – 268
A Microscopical Examination of Foods and Drugs – – – 269
Descriptive Mineralogy – – – – – – – – 271
Sicherheitseinrichtungen in chemischen Betrieben – – – – 271

No. 4

LEAD SILICATES. By H. C. Cooper, E. H. Kraus and A. A. Klein – 273
THE AMMONIA SYSTEM OF ACIDS, BASES AND SALTS. By Edward C. Franklin – – – – – – – – – – – 285
FURTHER STUDY OF TWO OF THE PRODUCTS OF THE TRANSFORMATION OF PARASULPHAMIDOBENZOIC ACID WHEN HEATED TO 220°. By J. S. Chamberlain – – – – – – – – – 318
STUDY OF THE PRODUCTS FORMED BY THE ACTION OF HEAT ON PARASULPHAMIDOMETATOLUIC ACID. By C. E. Waters – – – 333

REVIEWS

Mischen, Rühren, Kneten und die dazu verwendeten Maschinen – 352
Sulfurieren, Alkalischmelze der Sulfosäuren, Esterifizieren – – 353
The Manufacture of Sulphuric Acid and Alkali – – – – 354
Lubricating Oils, Fats and Greases – – – – – 355
The Manufacture of Chemical Manures – – – – 356
Galvanostegie – – – – – – – – – 356
Applied Electrochemistry – – – – – – – 357
Contribution à l'Historie de la Chimie – – – – – 358
The Identification of Organic Compounds – – – – 359
American Commission on Organic Nomenclature – – – 360
Erratum – – – – – – – – – – 360

No. 5

A Theory of the Mercury Ammonia Compounds. By Edward C. Franklin – – – – – – – – – 361
The Ozonization of Oxygen by α-Rays. By S. C. Lind – – 397
Notes on the Electrical Method of Morse and Gray for the Simultaneous Determination of Carbon, Hydrogen and Sulphur in Organic Compounds. By E. Emmet Reid – – 416
Some Transformations of Metasulphamidobenzoic Acid under the Influence of Heat. By Rokuro Nakaseko – – – 429

REVIEWS

The Elements of Qualitative Analysis – – – – – – 453
Electro-Analysis – – – – – – – – – 453
The Elements of Qualitative Chemical Analysis – – – 453
Theorie und Praxis der Massanalyse – – – – – – 455
The Technical Analysis of Brass and the Non-Ferrous Alloys – – 455
Kurzes Lehrbuch der organischen Chemie – – – – – 456
Modern Science Reader, with Special Reference to Chemistry – – 457
Pure Foods: Their Adulteration, Nutritive Value and Cost – – 457
Hypochlorite und elektrische Bleiche – – – – – – 458

No. 6

Contributions from the Sheffield Laboratory of Yale University:
CXCIX.—*Hydantoins: A New Method of Synthesizing N-Alkyl Derivatives of α-Amino Acids. Methyltyrosine.* By Treat B. Johnson and Ben H. Nicolet – – 459
Reaction between Carboxylic Acids and Benzenesulphonamide at High Temperatures. By Chas. A. Rouiller – – – 475
Atmospheric Ozone. By Harry N. Holmes – – – – 497
A New Bromine Method for the Determination of Thymol, Salicylates and Similar Compounds. By Atherton Seidell – 508

REVIEWS

Portland Cement – – – – – – – – – 526
Die Zustandsgleichung – – – – – – – – – 528
Traité de Chimie Générale – – – – – – – – – 529
Contemporary Chemistry – – – – – – – – – 529
Recherches Récentes sur les Facies des Cristaux – – – – 530
Fertility and Fertilizer Hints – – – – – – – 531
Die Zeresinfabrikation – – – – – – – – – 531
Quantitative Chemical Analysis – – – – – – – – 532
A Brief Laboratory Guide for Qualitative Analysis – – – 532
Traité Complet d'Analyse Chimique Appliqueé aux Essais Industriels 532
Index – – – – – – – – – – – – 533

INDEX TO VOL. XLVII

AUTHORS

ANSCHÜTZ, R. See *Couper, A. S.*

BERNTHSEN, A. and *Darapsky, A.* Kurzes Lehrbuch der organischen Chemie (Review).... 456
Bingham, E. C. Fluidity and vapor pressure..... 185
Bird, R. M. Modern science reader (Review)..... 457
Burnham, G. See *Johnson, T. B.*

CHAMBERLAIN, J. S. A further study of two of the products of the transformation of *p*-sulphamidobenzoic acid when heated to 220°..... 318
Chenu, G. See *Post, J.*
Classen, A. and *Cloeren, H.* Theorie und Praxis der Massanalyse (Review)..... 455
Cloeren, H. See *Classen, A.*
Clowes, F. and *Coleman, J. B.* Quantitative chemical analysis (Review)..... 532
Cohnheim, O. Chemie der Eiweisskörper (Review)..... 86
Coleman, J. B. See *Clowes, F.*
Colson, A. Contribution à l'histoire de la chimie (Review)..... 358
Cooper, H. C., Kraus, E. H. and *Klein, A. A.* Lead silicates. II. Optical and thermal analysis of the system $PbO\text{-}SiO_2$..... 273
Corvisy, A. See *Nernst, W.*
Couper, A. S. and *Anschütz, R.* Ueber eine neue chemische Theorie (Review)..... 267

DARAPSKY, A. See *Bernthsen, A.*

EBERT, W. and *Nussbaum, J.* Hypochlorite und elektrische Bleiche (Review)..... 458
Eisenlohr, F. See *Roth, W. A.*

FAGES·Y VIRGILI, J. and *Mecklenburg, W.* Die indirekten Methoden der analytischen Chemie (Review)..... 182
Fischer, H. Mischen, Rühren, Kneten und die dazu verwendeten Maschinen (Review)..... 352

Fournier d'Albe, E. E. Contemporary chemistry (Review)..... 529
Franklin, E. C. A theory of the mercury ammonia compounds. 361
" . The ammonia system of acids, bases and salts.. 285
Fritsch, J. and *Grant, D.* The manufacture of chemical manures (Review)..... 356

GAUBERT, M. P. Recherches récentes sur les facies des cristaux (Review)..... 530
Graham, T. and *Jordis, E.* Abhandlungen über Dialyse (Review). 268
Grant, D. See *Fritsch, J.*
Gray, R. W. and *Ramsay, W.* Density of niton ("radium emanation") and the disintegration theory (Note)..... 251
Greenish, H. G. A microscopical examination of foods and drugs (Review)..... 269
Guest, H. H. See *Johnson, T. B.*

HALLIGAN, J. E. Fertility and fertilizer hints (Review)..... 531
Hartmann, K. Sicherheitseinrichtungen in chemischen Betrieben (Review)..... 271
Heilbron, I. M. See *Neave, G. B.*
Hill, A. E. A brief laboratory guide for qualitative analysis (Review)..... 532
Hoffman, C. See *Johnson, T. B.*
Holmes, H. N. Atmospheric ozone..... 497
Hurst, G. H. and *Leask, H.* Lubricating oils, fats and greases (Review)..... 355

JACKSON, C. L. and *Kelley, G. L.* Certain derivatives of tetrachloro-o-benzoquinone..... 197
Jacobson, C. A. and *Marchlewski, L.* On the duality of chlorophyll and the variable ratio of the two constituents.... 221
Jago, W. and *Jago, W. C.* The technology of bread-making (Review)..... 180
" *W. C.* See *Jago, W.*
Johnson, T. B. and *Burnham, G.* Thioamides: The action of hydrogen sulphide on nitrogen-substituted aminoacetonitriles. 232
" and *Guest H. H.* Hydantoins: The action of potassium thiocyanate on pyrrolidone-carboxylic acid. 2-Thiohydantoin-4-propionic acid..... 242
" and *Hoffman, C.* On hydantoins: The action of bromine on tyrosinehydantoin. 20

" and *Nicolet, B. H.* Hydantoins: A new method of synthesizing N-alkyl derivatives of α-amino acids. Methyltyrosine..... 459

Jones, H. C. and *Strong, W. W.* The absorption spectra of comparatively rare salts. The spectrophotography of certain chemical reactions, and the effect of high temperature on the absorption spectra of nonaqueous solutions..... 27, 126

Jordis, E. See *Graham, T.*

KELLEY, G. L. See *Jackson, C. L.*

Klein, A. A. See *Cooper, H. C.*

Kraus, E. H. Descriptive mineralogy (Review)..... 271

" See *Cooper, H. C.*

LACH, B. Die Zeresinfabrikation (Review)..... 531

Leask, H. See *Hurst, G. H.*

Lind, S. C. The ozonization of oxygen by α-rays..... 397

London Patent Office. Subject list of works on chemistry (Review). 184

Lunge, G. The manufacture of sulphuric acid and alkali (Review). 354

MARCHLEWSKI, L. See *Jacobson, C. A.*

Marcusson, J. Laboratoriumsbuch für die Industrie der Oele und Fette (Review)..... 183

Mayer, R. and *Oettingen, A. von.* Die Mechanik der Wärme (Review)..... 267

Meade, R. K. Portland cement (Review)..... 526

" See *Price, W. B.*

Mecklenburg, W. See *Fages y Virgili, J.*

Medicus, L. Kurze Anleitung zur Massanalyse (Review)..... 86

Meyer, R. Jahrbuch der Chemie. 1910 (Review)..... 266

NAKASEKO, R. Some transformations of *m*-sulphamidobenzoic acid under the influence of heat..... 429

Neave, G. B. and *Heilbron, I. M.* The identification of organic compounds (Review)..... 359

Neumann, B. See *Post, J.*

Nernst, W. and *Corvisy, A.* Traité de chimie générale. II (Review)..... 529

Nicolet, B. H. See *Johnson, T. B.*

Noyes, W. A. and *Smith, G. McP.* The elements of qualitative analysis (Review)..... 453

Nussbaum, J. See *Ebert, W.*

OETTINGEN, A. VON. See *Mayer, R.*
Olsen, J. C. Pure foods (Review) 457
Oppenheimer, C. Grundriss der anorganischen Chemie (Review). 86
Orndorff, W. R. and *Pratt, D. S.* The two phthaloximes and some of their derivatives 89

PELLET, M. See *Post, J.*
Polytechnic Institute of Brooklyn Undergraduates. The Polytechnic Engineer (Review) 88
Post, J., Neumann, B., Chenu, G. and *Pellet, M.* Traité complet d'analyse chimique. III, 1 (Review) 532
Poulenc, C. Les nouveautés chimiques pour 1910 (Review) 88
Pratt, D. S. See *Orndorff, W. R.*
Price, W. B. and *Meade, R. K.* The technical analysis of brass and the non-ferrous alloys (Review) 456

RAMSAY, W. See *Gray, R. W.*
Reid, E. E. Notes on the electrical method of Morse and Gray for the simultaneous determination of carbon, hydrogen, and sulphur in organic compounds 416
Roberts, E. Famous chemists (Review) 267
Roemer, H. See *Tietjens, L.*
Roth, W. A. and *Eisenlohr, F.* Refraktometrisches Hilfsbuch (Review) 268
Rouiller, C. A. Reaction between carboxylic acids and benzenesulphonamide at high temperatures 475

SCHLOETTER, M. Galvanostegie. I. (Review) 356
Seidell, A. A new bromine method for the determination of thymol, salicylates and similar compounds 508
Smith, E. F. Electro-analysis (Review) 453
" *G. McP.* See *Noyes, W. A.*
Stieglitz, J. The elements of qualitative chemical analysis (Review) 453
Stoddard, W. B. A further study of the products formed by the action of heat on *p*-sulphamidobenzoic acid 1
Strong, W. W. See *Jones, H. C.*
Sutton, F. and *Sutton, W. L.* A systematic handbook of volumetric analysis (Review) 87
" *W. L.* See *Sutton, F.*

THOMPSON, M. DEK. Applied electrochemistry (Review) 357

Tietjens, L. and *Roemer, H.* Laboratoriumsbuch für die Kaliindustrie (Review) ... 87

URBAIN, G. Introduction à l'étude de la spectrochimie (Review) ... 85

VAN DER WAALS, J. D. Die Zustandsgleichung (Review) ... 528

WATERS, C. E. A study of the products formed by the action of heat on *p*-sulphamido-*m*-toluic acid ... 333
Weinland, R. Anleitung für das Praktikum in der Massanalyse (Review) ... 183
Wichelhaus, A. Sulfurieren, Alkalischmelze der Sulfosäuren, Esterifizieren (Review) ... 353

ZACHARIAS, J. Elektrochemische Umformer (Review) ... 181

SUBJECTS

ABSORPTION spectra of comparatively rare salts. Spectrophotography of certain chemical reactions, and the effect of high temperature in the absorption spectra of nonaqueous solutions. *Jones* and *Strong* ... 27, 126
Acetamidine benzenesulphonate. *Rouiller* ... 488
Aluminium chromate, absorption spectrum of. *Jones* and *Strong* ... 35
Aminoacetonitriles, action of hydrogen sulphide on nitrogen-substituted. *Johnson* and *Burnham* ... 232
Ammonia system of acids, bases and salts. *Franklin* ... 285
Anisoylaminoacetonitrile. *Johnson* and *Burnham* ... 238
Anisoylaminoacetothioamide. *Johnson* and *Burnham* ... 239
4-Anisylhydantoin. *Johnson* and *Nicolet* ... 474

BENZAMIDINE benzenesulphonate. *Rouiller* ... 483
Benzamidine *p*-toluenesulphonate. *Rouiller* ... 487
Benzenesulphonamide and carboxylic acids, reaction between, at high temperatures. *Rouiller* ... 475
p-Benzoic sulphinide (?) *Stoddard* ... 10
Chamberlain ... 319
Rouiller ... 496
m-Bromobenzamidine benzenesulphonate. *Rouiller* ... 492

CALCIUM chromate, ferrocyanide and ferricyanide, absorption spectra of. *Jones* and *Strong* ... 35
p-Carbamidobenzenesulphonic acid. *Stoddard* ... 5
Chamberlain ... 326

Carbamido-*m*-toluene-*p*-sulphonic acid, salts of. *Waters*..... 337
Carbethoxyaminoacetothioamide. *Johnson* and *Burnham*..... 236
Carboxylic acids and benzenesulphonamide, reaction between, at high temperatures. *Rouiller*..... 475
Chlorophyll, duality of, and the variable ratio of the two constituents. *Jacobson* and *Marchlewski*..... 221
Copper bichromate, absorption spectrum of. *Jones* and *Strong*.. 35
p-Cyanobenzamide. *Rouiller*..... 495
p-Cyanobenzamidine benzenesulphonate. *Rouiller*..... 495

3,5-DIBROMO-4-HYDROXYBENZALHYDANTOIN. *Johnson* and *Hoffman*..... 24
3,5-Dibromo-4-hydroxybenzylhydantoic acid (3,5-dibromotyrosinehydantoic acid). *Johnson* and *Hoffman*..... 23
3,5-Dibromotyrosinehydantoic acid. *Johnson* and *Hoffman*..... 23
3,5-Dibromotyrosinehydantoin. *Johnson* and *Hoffman*..... 23
3,5-Diiodotyrosinehydantoin. *Johnson* and *Hoffman*..... 26
1,3-Dimethyl-4-anisalhydantoin. *Johnson* and *Nicolet*..... 468
1,3-Dimethyl-4-*p*-hydroxybenzylhydantoin (1,3-dimethyltyrosinehydantoin). *Johnson* and *Nicolet*..... 470
1,3-Dimethyl-4-*p*-methoxybenzylhydantoin. *Johnson* and *Nicolet* 472
1,3-Dimethyltyrosinehydantoin. *Johnson* and *Nicolet*..... 470
Dysprosium acetate and chloride, adsorption spectra of. *Jones* and *Strong*..... 50

ELECTRICAL method of Morse and Gray for the simultaneous determination of carbon, hydrogen and sulphur in organic compounds, notes on the. *Reid*..... 416
Erbium chloride, absorption spectrum of. *Jones* and *Strong*..... 137
Erratum..... 360

FLUIDITY and vapor pressure. *Bingham*..... 185

GADOLINIUM chloride, absorption spectrum of. *Jones* and *Strong*..... 49
Glycolurothioamide. *Johnson* and *Burnham*..... 241

HEPTACHLORODIACETOXYPYROCATECHIN acetylhemiether. *Jackson* and *Kelley*..... 207
Heptachlorodihydroxypyrocatechin hemiether. *Jackson* and *Kelley*..... 206
Heptachloro-*o*-quinopyrocatechin acetylhemiether. *Jackson* and *Kelley*..... 205
Heptachloro-*o*-quinopyrocatechin hemiether. *Jackson* and *Kelley*. 202
Hexachloro-*o*-diacetoxypyrocatechin ether. *Jackson* and *Kelley*.. 221

Hexachloroethoxy-*o*-diacetoxypyrocatechin acetylhemiether. *Jackson* and *Kelley*..... 218
Hexachloroethoxy-*o*-dihydroxypyrocatechin hemiether. *Jackson* and *Kelley*..... 217
Hexachloroethoxy-*o*-quinopyrocatechin acetylhemiether. *Jackson* and *Kelley*..... 216
Hexachloroethoxy-*o*-quinopyrocatechin hemiether. *Jackson* and *Kelley*..... 213
Hexachloro-*o*-hydroxyacetoxypyrocatechin ether. *Jackson* and *Kelley*..... 220
Hexachloromethoxy-*o*-acetoxyhydroxypyrocatechin hemiether. *Jackson* and *Kelley*..... 212
Hexachloromethoxy-*o*-diacetoxypyrocatechin hemiether. *Jackson* and *Kelley*..... 211
Hexachloromethoxy-*o*-dihydroxypyrocatechin hemiether. *Jackson* and *Kelley*..... 209
Hexachloromethoxy-*o*-quinopyrocatechin hemiether. *Jackson* and *Kelley*..... 208
Hippurothioamide. *Johnson* and *Burnham*..... 235
Hydantoin-4-propionic acid. *Johnson* and *Guest*..... 249
Hydantoins:
Action of bromine on tyrosinehydantoin. *Johnson* and *Hoffman*..... 20
Action of potassium thiocyanate on pyrrolidonecarboxylic acid. 2-Thiohydantoin-4-propionic acid. *Johnson* and *Guest*..... 242
A new method of synthesizing N-alkyl derivatives of α-amino acids. Methyltyrosine. *Johnson* and *Nicolet*..... 459

"INFUSIBLE diamide" of *m*-sulphobenzoic acid. *Nakaseko*.... 441
"Infusible diamide" of *p*-sulphobenzoic acid. *Stoddard*..... 3
Chamberlain..... 324
Rouiller..... 492
"Infusible diamide" of *p*-sulpho-*m*-toluic acid. *Waters*..... 336

LEAD silicates. II. Optical and thermal analysis of the system PbO-SiO_2. *Cooper, Kraus* and *Klein*..... 273
Lithium chromate and bichromate, absorption spectra of. *Jones* and *Strong*..... 35

MERCURY ammonia compounds, a theory of the. *Franklin*.... 361
α - Methylamino - β - [3,5 - diiodo - 4 - hydroxyphenyl]propionic acid (methyliodogorgoic acid.) *Johnson* and *Nicolet*..... 474
α - Methylamino - β - *p* - hydroxyphenylpropionic acid (methyl - tyrosine). *Johnson* and *Nicolet*..... 471

α-Methylamino-β-*p*-methoxyphenylpropionic acid. *Johnson* and *Nicolet*..... 472
1-Methyl-4-anisalhydantoin. *Johnson* and *Nicolet*..... 469
1 - Methyl - 4 - *p* - hydroxybenzylhydantoin (1 - methyltyrosine - hydantoin). *Johnson* and *Nicolet*..... 470
Methyliodogorgoic acid. *Johnson* and *Nicolet*..... 474
3-Methyl-1-phenyl-4-anisyl-2-thiohydantoin. *Johnson* and *Nicolet*. 473
Methyltyrosine. *Johnson* and *Nicolet*..... 471
1-Methyltyrosinehydantoin. *Johnson* and *Nicolet*..... 470

NEODYMIUM acetate, bromide, chloride and nitrate, absorption spectra of. *Jones* and *Strong*..... 36, 133
Niton ("radium emanation"), density of, and the disintegration theory (Note). *Gray* and *Ramsay*..... 251
m- and *p*-Nitrobenzamidine benzenesulphonates. *Rouiller*..... 491
Nomenclature, American Commission on Organic..... 360

OBITUARY:
Brunck, Heinrich von..... 265
Ozone, atmospheric. *Holmes*..... 497
Ozonization of oxygen by α-rays. *Lind*..... 397

PHENYLACETAMIDINE benzenesulphonate. *Rouiller*..... 492
Phenylaminoacetothioamide. *Johnson* and *Burnham*..... 239
α-Phenyl-μ-aminomethylthiazole hydrobromide. *Johnson* and *Burnham*..... 238
α-Phenyl-μ-benzoylaminomethylthiazole. *Johnson* and *Burnham*. 236
α-Phenyl-μ-carbamylaminomethylthiazole. *Johnson* and *Burnham*..... 241
α-Phenyl-μ-carbethoxyaminomethylthiazole. *Johnson* and *Burnham*..... 237
α-Phenyl-μ-tolylaminomethylthiazole. *Johnson* and *Burnham*.. 239
1 - Phenyl - 3 - tolyl - 2 - thio - 5 - phenylthioureadihydroglyoxaline *Johnson* and *Burnham*..... 240
m- and *p*-Phthalic dinitriles. *Rouiller*..... 493
Phthalimide. *Rouiller*..... 493
Phthaloximes and some of their derivatives, the two. *Orndorff* and *Pratt*..... 89
Potassium nickel chromate, absorption spectrum of. *Jones* and *Strong*..... 35
Pyrrolidonecarboxylic acid, action of potassium thiocyanate on. *Johnson* and *Guest*..... 242
Pyrrolidonecarboxylic acid thiohydantoin. *Johnson* and *Guest*.. 247

REVIEWS:
Anorganischen Chemie, Grundriss der. *Oppenheimer*..... 86

Analyse chimique, traité complet d'. III, 1. *Post, Neumann, Chenu* and *Pellet*. 532
Analytischen Chemie, die indirekten Methoden der. *Fages y Virgili* and *Mecklenburg*. 182
Brass and the non-ferrous alloys, the technical analysis of. *Price* and *Mead* 456
Bread-making, the technology of. *Jago* and *Jago*. 180
Chemische Theorie, über eine neue. *Couper* and *Anschütz*. . . 267
Chemistry, contemporary. *Fournier d'Albe*. 529
Chemistry, subject list of works on. *London Patent Office*. . . 184
Chemists, famous. *Roberts*. 267
Chimie générale, traité de. II. *Nernst* and *Corvisy*. 529
Cristaux, recherches récentes sur les facies des. *Gaubert*. . . . 530
Dialyse, Abhandlungen über. *Graham* and *Jordis*. 268
Eiweisskörper, Chemie der. *Cohnheim*. 86
Electro-analysis. *Smith*. 453
Electrochemistry, applied. *Thompson*. 357
Fertility and fertilizer hints. *Halligan*. 531
Foods, pure. *Olsen*. 457
Foods and drugs, a microscopical examination of. *Greenish*. 269
Galvanostegie. I. *Schlötter*. 356
Histoire de la chimie, contribution à l'. *Colson*. 358
Hypochlorite und elektrische Bleiche. *Ebert* and *Nussbaum*. 458
Jahrbuch der Chemie. 1910. *Meyer*. 266
Kaliindustrie, Laboratoriumsbuch für die. *Tietjens* and *Roemer*. 87
Lubricating oils, fats and greases. *Hurst* and *Leask*. 355
Manures, the manufacture of chemical. *Fritsch* and *Grant*. . 356
Massanalyse, Anleitung für das Praktikum in der. *Weinland*. 183
Massanalyse, kurze Anleitung zur. *Medicus*. 86
Massanalyse, Theorie und Praxis der. *Classen* and *Cloeren*. . 455
Mineralogy, descriptive. *Kraus*. 271
Mischen, Rühren, Kneten und die dazu verwendeten Maschinen. *Fischer*. 352
Nouveautés chimiques pour 1910, les. *Poulenc*. 88
Oele und Fette, Laboratoriumsbuch für die Industrie der. *Marcusson*. 183
Organic compounds, the identification of. *Neave* and *Heilbron*. 359
Organischen Chemie, kurzes Lehrbuch der. *Bernthsen* and *Darapsky*. 456
Polytechnic Engineer, The. *Polytechnic Institute of Brooklyn Undergraduates* 88
Portland cement. *Meade*. 526
Qualitative analysis, a brief laboratory guide for. *Hill*. 532

Qualitative analysis, the elements of. *Noyes* and *Smith*.... 453
Qualitative chemical analysis, the elements of. *Stieglitz*.... 453
Quantitative chemical analysis. *Clowes* and *Coleman*..... 532
Refraktometrisches Hilfsbuch. *Roth* and *Eisenlohr*..... 268
Science reader, modern. *Bird*..... 457
Sicherheitseinrichtungen in chemischen Betrieben. *Hartmann* 271
Spectrochimie, introduction à l'étude de la. *Urbain*..... 85
Sulfurieren, Alkalischmelze der Sulfosäuren, Esterifizieren. *Wichelhaus*..... 353
Sulphuric acid and alkali, the manufacture of. III. *Lunge*.. 354
Umformer, elektrochemische. *Zacharias*..... 181
Volumetric analysis, a systematic handbook of. *Sutton* and *Sutton*..... 87
Wärme, die Mechanik der. *Mayer* and *Oettingen*..... 267
Zeresinfabrikation, die. *Lach*..... 531
Zustandsgleichung, die. *Van der Waals*..... 528

SALICYLATES, thymol and similar compounds, a new bromine method for the determination of. *Seidell*..... 508
Samarium chloride and nitrate, absorption spectra of. *Jones* and Strong..... 53
m-Sulphamidobenzoic acid, some transformations of, under the influence of heat. *Nakaseko*..... 429
p-Sulphamidobenzoic acid, a further study of the products formed by the action of heat on. *Stoddard*..... 1
p-Sulphamidobenzoic acid, further study of two of the products formed when it is heated to 220°. *Chamberlain*..... 318
p-Sulphamido-*m*-toluic acid, study of the products formed by the action of heat on. *Waters*..... 333
m-Sulphobenzamidine. *Nakaseko*..... 441
p-Sulphobenzamidine. *Stoddard*..... 3
Chamberlain..... 324
Rouiller..... 492
m-Sulphobenzoic acid, acid ammonium and barium salts of. *Nakaseko*..... 439
p-Sulpho-*m*-toluamidine. *Waters*..... 336
p-Sulpho-*m*-toluic acid. *Waters*..... 343
Suranamine. *Johnson* and *Nicolet*..... 459

TETRACHLORO-*o*-BENZOQUINONE, certain derivatives of. *Jackson* and *Kelley*..... 197
Thioamides: Action of hydrogen sulphide on nitrogen-substituted aminoacetonitriles. *Johnson* and *Burnham*..... 232
2-Thiohydantoin-4-propionic acid. *Johnson* and *Guest*..... 242
Thymol, salicylates and similar compounds, a new bromine method for the determination of. *Seidell*..... 508

p-Tolylaminoacetothioamide. *Johnson* and *Burnham*..... 239
Tyrosinehydantoin, action of bromine on. *Johnson* and *Hoffman*. 20

URANOUS and uranyl chlorides and nitrates, absorption spectra of. *Jones* and *Strong*..... 45, 138

VAPOR pressure and fluidity. *Bingham*..... 185

FORMULAS

C_3-GROUP

3 IV

$C_3H_7ON_2S$. Amide of ureinothioacetic acid. *Johnson* and *Burnham*..... 241

C_5-GROUP

5 IV

$C_5H_{10}O_2N_2S$. Amide of carbethoxyaminothioacetic acid. *Johnson* and *Burnham*..... 236

C_6-GROUP

6 III

$C_6H_8O_4N_2$. β-[2,5-Diketotetrahydro-1,3-diazole-5]ethane-α-carboxylic acid. *Johnson* and *Guest*..... 249

6 IV

$C_6H_6O_2N_2S$. Imide of 5-ketotetrahydroazole-2-carboxylic-1-thiocarboxylic acid. *Johnson* and *Guest*..... 247
$C_6H_6O_3N_2S$. β-[5-Keto-2-thioketotetrahydro-1,3-diazole-4]ethane-α-carboxylic acid. *Johnson* and *Guest*..... 248

C_7-GROUP

7 III

$C_7H_6O_5S$. Benzene-1-carboxylic-3-sulphonic acid. $NH_4 + H_2O$, $\frac{1}{2}Ba + 2H_2O$. *Nakaseko*..... 439

7 IV

$C_7H_5O_3NS$. Imide of benzene-1-carboxylic-4-sulphonic acid(?) NH_4, $Na + 1H_2O$, $Ba + 3$ or $4H_2O$, Cu, $Pb + 3H_2O$. *Stoddard*..... 10
Chamberlain..... 319
Rouiller..... 496
$C_7H_7O_4NS$. (1) 3-Amide of benzene-1-carboxylic-3-sulphonic acid. *Nakaseko*..... 429
(2) Isomeric modifications of the 3-amide of benzene-1-carboxylic-3-sulphonic acid. *Nakaseko*..... 448
(3) 1-Amide of benzene-1-carboxylic-4-sulphonic acid. K, $Mg + 4H_2O$, Ba. *Stoddard*..... 5
Chamberlain..... 326

(4) 4-Amide of benzene-1-carboxylic-4-sulphonic acid. *Stoddard* ... 1
Chamberlain ... 318
$C_7H_8O_3N_2S$. (1) 1-Amidoimidomethylbenzene-3-sulphonic acid. *Nakaseko* ... 441
(2) 1-Amidoimidomethylbenzene-4-sulphonic acid. *Stoddard* 3
Chamberlain ... 324
Rouiller ... 492

C_8-GROUP

8 II

$C_8H_4N_2$. (1) 1,3-Dicyanobenzene. *Rouiller* ... 493
(2) 1,4-Dicyanobenzene. *Rouiller* ... 494

8 III

$C_8H_5O_2N$. Imide of benzene-1,2-dicarboxylic acid. *Rouiller* ... 493
$C_8H_5O_3N$. (1) Colorless anhydride of 2-hydroxyiminohydroxymethylbenzene-1-carboxylic acid (phthaloxime). NH_4, Na, NaH, K, KH, Ag. *Orndorff* and *Pratt* ... 93
(2) Yellow phthaloxime. NH_4, Na, NaH, K, KH, Ag. *Orndorff* and *Pratt* ... 95
$C_8H_6ON_2$. Amide of 4-cyanobenzene-1-carboxylic acid. *Rouiller*. 495
$C_8H_6O_3S$. 3-Methylbenzene-1-carboxylic-4-sulphonic acid. NH_4, Na + $2.5H_2O$, Na + $3H_2O$, Ba + H_2O, Ba + $2H_2O$, $\frac{1}{2}$Ba + $2.5H_2O$. *Waters* ... 343
$C_8H_{10}N_2S$. Amide of phenylaminothioacetic acid. *Johnson* and *Burnham* ... 239

8 IV

$C_8H_9O_4NS$. (1) 1-Amide of 3-methylbenzene-1-carboxylic-4-sulphonic acid. NH_4, K + H_2O, Mg + $4H_2O$, Ba + H_2O, Cu + $3H_2O$, Zn + $5.5H_2O$. *Waters* ... 338
(2) 4-Amide of 3-methylbenzene-1-carboxylic-4-sulphonic acid. *Waters* ... 333
$C_8H_{10}O_2N_2S$. 3-Methyl-1-amidoimidomethylbenzene-4-sulphonic acid. *Waters* ... 336
$C_8H_{12}O_2N_2S$. α-Amido-α-imidoethane salt of benzenesulphonic acid. *Rouiller* ... 488

C_9-GROUP

9 III

$C_9H_{12}N_2S$. Amide of 4-methylphenylaminothioacetic acid. *Johnson* and *Burnham* ... 239

9 IV

$C_9H_{10}ON_2S$. Amide of benzoylaminothioacetic acid. *Johnson* and *Burnham* ... 235

C_{10}-GROUP

10 III

$C_{10}H_7O_4N$. (1) Acetate of the colorless anhydride of 2-hydroxyiminohydroxymethylbenzene-1-carboxylic acid. *Orndorff* and *Pratt*..... 109

(2) Acetate of the yellow anhydride of 2-hydroxyiminohydroxymethylbenzene-1-carboxylic acid. *Orndorff* and *Pratt*. 111

$C_{10}H_9O_4N$. (1) Ethyl ether of the colorless anhydride of 2-hydroxyiminohydroxymethylbenzene-1-carboxylic acid. *Orndorff* and *Pratt*..... 113

(2) Ethyl ether of the yellow anhydride of 2-hydroxyiminohydroxymethylbenzene-1-carboxylic acid. *Orndorff* and *Pratt*..... 113

$C_{10}H_{10}O_2N_2$. Cyanomethylamide of 4-methoxybenzene-1-carboxylic acid. *Johnson* and *Burnham*..... 238

$C_{10}H_{10}N_2S$. 2-Aminomethyl-4-phenylthiazole. 2HBr. *Johnson* and *Burnham*..... 238

$C_{10}H_{13}O_3N$. β-[4-Hydroxyphenyl]-α-methylaminoethane-α-carboxylic acid (methyltyrosine). *Johnson* and *Nicolet*..... 471

10 IV

$C_{10}H_6O_2N_2Br_2$. 4-[3,5-Dibromo-4-hydroxyphenylmethenyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Hoffman*..... 24

$C_{10}H_8O_3N_2Br_2$. 4-[3,5-Dibromo-4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Hoffman*..... 23

$C_{10}H_8O_3N_2I_2$. 4-[3,5-Diiodo-4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Hoffman*..... 26

$C_{10}H_{10}O_4N_2Br_2$. β-[3,5-Dibromo-4-hydroxyphenyl]-α-ureidoethane-α-carboxylic acid. *Johnson* and *Hoffman*..... 23

$C_{10}H_{11}O_3NI_2$. β-[3,5-Diiodo-4-hydroxyphenyl]-α-methylaminoethane-α-carboxylic acid (methyliodogorgoic acid). *Johnson* and *Nicolet*..... 474

$C_{10}H_{12}O_2N_2S$. Amide of 4-methoxybenzoylaminothioacetic acid. *Johnson* and *Burnham*..... 239

C_{11}-GROUP

11 III

$C_{11}H_{12}O_3N_2$. (1) Methyl ether of 4-[4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet*..... 474

(2) 1-Methyl-4-[4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet*..... 470

$C_{11}H_{13}O_3N$. Methyl ether of β-[4-hydroxyphenyl]-α-methylaminoethane-α-carboxylic acid. *Johnson* and *Nicolet*..... 472

11 IV

$C_{11}H_{11}ON_2S$. 2-Ureinomethyl-4-phenylthiazole. HBr. *Johnson* and *Burnham*..... 241

C_{13}-GROUP
12 III

$C_{13}HO_4Cl_7$. 3,4,5,6-Tetrachloro-2-hydroxyphenyl ether of 2,5,6-trichloro-3,4-diketo-1-hydroxy-3,4-dihydrobenzene. + $0.5C_6H_6$. *Jackson* and *Kelley* 202

$C_{13}H_5O_4Cl_7$. 1-[3,4,5,6-Tetrachloro-2-hydroxyphenyl] ether of 2,5,6-trichloro-1,3,4-trihydroxybenzene. *Jackson* and *Kelley* 206

$C_{13}H_{12}O_2N_2$. Methyl ether of 1-methyl-4-[4-hydroxyphenylmethenyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet*. 469

$C_{13}H_{14}O_2N_2$. 1,3-Dimethyl-4-[4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet* 470

C_{13}-GROUP
13 III

$C_{13}H_4O_4Cl_6$. 3,4,5,6-Tetrachloro-2-hydroxyphenyl ether of 2,5-dichloro-3,4-diketo-6-methoxy-1-hydroxy-3,4-dihydrobenzene. *Jackson* and *Kelley* 208

$C_{13}H_5O_5Cl_6$. 1-[3,4,5,6-Tetrachloro-2-hydroxyphenyl] ether of 2,5-dichloro-6-methoxy-1,3,4-trihydroxybenzene. *Jackson* and *Kelley* 209

$C_{13}H_{12}O_4N_2$. Methyl ether of 1,3-dimethyl-4-[4-hydroxyphenylmethenyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet* 468

$C_{13}H_{16}O_4N_2$. Methyl ether of 1,3-dimethyl-4-[4-hydroxyphenylmethyl]-2,5-diketotetrahydro-1,3-diazole. *Johnson* and *Nicolet* 472

13 IV

$C_{13}H_{13}O_6N_3S$. (1) 3-Nitro-1-amidoimidomethylbenzene salt of benzenesulphonic acid. *Rouiller* 491

(2) 4-Nitro-1-amidoimidomethylbenzene salt of benzenesulphonic acid. *Rouiller* 491

$C_{13}H_{14}O_2N_2S$. 2-Carbethoxyaminomethyl-4-phenylthiazole. HBr. *Johnson* and *Burnham* 237

$C_{13}H_{14}O_3N_2S$. Amidoimidomethylbenzene salt of benzenesulphonic acid. *Rouiller* 483

13 V

$C_{13}H_{13}O_3N_2BrS$. 3-Bromo-1-amidoimidomethylbenzene salt of benzenesulphonic acid. *Rouiller* 492

C_{14}-GROUP
14 III

$C_{14}H_5O_5Cl_7$. Acetate of the 3,4,5,6-tetrachloro-2-hydroxyphenyl ether of 2,5,6-trichloro-3,4-diketo-1-hydroxy-3,4-dihydrobenzene. *Jackson* and *Kelley* 205

$C_{14}H_4O_3Cl_6$. ?-Acetate of the 1,6-[3,4,5,6-tetrachlorophenylene] ether of 2,5-dichloro-1,3,4,6-tetrahydroxybenzene. *Jackson* and *Kelley*..... 220

$C_{14}H_8O_3Cl_6$. 3,4,5,6-Tetrachloro-2-hydroxyphenyl ether of 2,5-dichloro-3,4-diketo-6-ethoxy-1-hydroxy-3,4-dihydrobenzene. *Jackson* and *Kelley*..... 213

$C_{14}H_8O_3Cl_6$. 1-[3,4,5,6-Tetrachloro-2-hydroxyphenyl] ether of 2,5-dichloro-6-ethoxy-1,3,4-trihydroxybenzene. *Jackson* and *Kelley*..... 217

14 IV

$C_{14}H_{14}O_3N_2S$. 4-Cyano-1-amidoimidomethylbenzene salt of benzenesulphonic acid. *Rouiller*..... 495

$C_{14}H_{16}O_3N_2S$. (1) α-Amido-α-imido-β-phenylethane salt of benzenesulphonic acid. *Rouiller*..... 488

(2) Amidoimidomethylbenzene salt of 1-methylbenzene-4-sulphonic acid. *Rouiller*..... 487

C_{15}-GROUP

15 III

$C_{15}H_8O_6Cl_6$. ?,2′-Diacetate of the 1-[3′,4′,5′,6′-tetrachloro-2′-hydroxyphenyl] ether of 2,5-dichloro-6-methoxy-1,3,4-trihydroxybenzene. *Jackson* and *Kelley*..... 212

C_{16}-GROUP

16 III

$C_{16}H_8O_6Cl_6$. Diacetate of the 1,6-[3,4,5,6-tetrachlorophenylene] ether of 2,5-dichloro-1,3,4,6-tetrahydroxybenzene. *Jackson* and *Kelley*..... 221

$C_{16}H_8O_6Cl_6$. Acetate of the 3,4,5,6-tetrachloro-2-hydroxyphenyl ether of 2,5-dichloro-3,4-diketo-6-ethoxy-1-hydroxy-3,4-dihydrobenzene. *Jackson* and *Kelley*..... 216

C_{17}-GROUP

17 III

$C_{17}H_{16}N_2S$. 2-[4-Methylphenylaminomethyl]-4-phenylthiazole. *Johnson* and *Burnham*..... 239

17 IV

$C_{17}H_{14}ON_2S$. Benzoylaminomethyl-4-phenylthiazole. *Johnson* and *Burnham*..... 236

C_{18}-GROUP

18 III

$C_{18}H_9O_7Cl_7$. Triacetate of the 1-[3,4,5,6-tetrachloro-2-hydroxyphenyl] ether of 2,5,6-trichloro-1,3,4-trihydroxybenzene. *Jackson* and *Kelley*..... 207

18 IV

$C_{18}H_{18}O_2N_2S$. Methyl ether of 3-methyl-1-phenyl-4-[4-hydroxyphenylmethyl] - 5 - keto - 2 - thioketotetrahydro - 1,3 - diazole. *Johnson* and *Nicolet*..... 473

C_{19}-GROUP

19 III

$C_{19}H_{12}O_8Cl_6$. Triacetate of the 1-[3,4,5,6-tetrachloro-2-hydroxyphenyl] ether of 2,5-dichloro-6-methoxy-1,3,4-trihydroxybenzene. *Jackson* and *Kelley*..... 211

C_{20}-GROUP

20 III

$C_{20}H_{14}O_8Cl_6$. Triacetate of the 1-[3,4,5,6-tetrachloro-2-hydroxyphenyl] ether of 2,5-dichloro-6-ethoxy-1,3,4-trihydroxybenzene. *Jackson* and *Kelley*..... 218

C_{21}-GROUP

23 III

$C_{23}H_{20}N_4S_2$. 1 - Phenyl - 3 - [4 - methylphenyl] - 5 - phenylthio - ureino - 2 - thioketo - 2,3 - dihydro - 1,3 - diazole. *Johnson* and *Burnham*..... 240